Remarks

Claims 1–48 and 60 are under examination in this case and are rejected. Claims 4, 5, 32 and 49–59 have been canceled without prejudice. Applicant reserve the right to pursue the subject matter of canceled claims in a continuing application. This amendment adds new claims 61–64; these new claims are supported throughout the application as originally filed and in particular at least in original claims 6, 15, 19, 25, 33 and 45, as well as on page 4, lines 9–16. Accordingly, no new matter is added by these claims. Applicants request reconsideration of claims 1–3, 6–31, 33–48 and 60 as well consideration of new claims 61–64 in view of the foregoing amendments and following remarks.

I.   Rejections Under 35 U.S.C. § 112

Claims 4–6 and 32 are rejected under 35 U.S.C. § 112 as allegedly being indefinite. Applicants disagree, but to expedite prosecution have canceled claims 4, 5 and 32 and have amended claim 6. In particular, the allegedly indefinite last two lines of claim 6 have been replaced with a Markush group of elements for variable M_y. Claim 6 also has been amended to be in independent form. Accordingly, applicants respectfully request that the rejections under 35 U.S.C. § 112 be withdrawn.

II.   Claim Interpretation

The Office action states that M and M' are not required in claim 1, "where x is from about zero to about 1." Applicants disagree because about zero is not equal to zero. Nonetheless, to expedite prosecution, applicants have amended claim 1 to state that "x is greater than zero and less than about 1."

III.   Rejections Under 35 U.S.C. § 102

Claims 1–6, 11–13, 15, 17, 19–27, 31–33, 41–43 and 60 are rejected under 35 U.S.C. § 102(b) as allegedly being anticipated by Gruber et al. (Journal of Applied Physics 2000, 87, 7159). Applicants traverse this rejection and request that it be withdrawn.

This rejection appears to be based on the claim interpretation that M and M' are not required and thus applicants disagree with the basis for the rejection for the reasons stated above concerning claim interpretation. Specifically, with respect to the Gruber reference, the Office

action states that it discloses $LaSc_3(BO_3)_4$ and $PrSc_3(BO_3)_4$. Such compounds are referred to in the literature, including the Durmanov reference of record, as "binary borates." These compounds are irrelevant to the present claims, which are directed to higher order materials, such as those recited in claim 1 having the formula $La_{1-x}(M, M')_xSc_3(BO_3)_4$ where x is greater than zero and less than one, and M and M' are selected from the group consisting of Pr, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb, Lu, and Y.

Claims 1, 3–5, 15, 19–22 and 60 also are rejected under 35 U.S.C. § 102(b) as allegedly being anticipated by U.S. Patent No. 5,879,803 to Masaki et al. (Masaki). Applicants traverse this rejection and request that it be withdrawn because the compound $ScBO_3$ allegedly disclosed by Masaki neither teaches nor suggests any compounds according to the present claims. For example $ScBO_3$ fails to fit within the formula $La_{1-x}(M, M')_xSc_3(BO_3)_4$ recited in claim 1. Applicants therefore respectfully request than the rejection based on Masaki be withdrawn.

Claims 1–7, 11–17, 33–37 and 41–47 also are rejected under 35 U.S.C. § 102(b) as allegedly being anticipated by Durmanov et al. *Optical Materials* **2001**, *18*, 243–284 (Durmanov). Applicants traverse this rejection and request that it be withdrawn because Durmanov fails to teach or suggest any compound within the formulas recited in applicants' currently pending claims. For example, the Office action states that Durmanov discloses compounds having the formulas $La_{0.85}Pr_{0.21}Sc_{2.94}(BO_3)_{3.8}$ and $LaSc_{2.94}Yb_{0.15}(BO_3)_{3.8}$. However these compounds are not within the scope of claim 1, for at least the reason that praseodymium (Pr) is not including the formula of claim 1. Furthermore, the formula $LaSc_{2.94}Yb_{0.15}(BO_3)_{3.8}$ is outside the scope of claim 1 for at least the reason that $LaSc_{2.94}Yb_{0.15}(BO_3)_{3.8}$ has a subscript for La of 1, in contrast with the formula of claim 1, which recites a subscript for La of 1-x, wherein x is greater than zero. Because Durmanov fails to teach any compounds with the scope of claim 1, applicants respectfully request that the rejection over this reference under 35 U.S.C. § 102(b) be withdrawn.

IV. Rejections Under 35 U.S.C. § 103

Claims 1–6, 11–13, 15, 17, 19–27, 31–33, 41–43 and 60 are rejected under 35 U.S.C. § 103 as allegedly being obvious in view of Kuz'min *Quantum Electronics* **1998**, *28*, 50–54 (Kuz'min). Applicants traverse this rejection and request that it be withdrawn because it fails to teach or suggest any of the presently claimed compounds. As noted in the Office action Kuz'min

discusses certain binary borate compounds, such as $LaSc_3(BO_3)_4$. The disclosure cited by the Office action as alleged teaching mixed lanthanide scandium borates specifically recites $Nd:Ce_{1-x}Gd_xSc_3(BO_3)_4$ this specific compound is unrelated to the presently claimed compounds and fails to suggest any compound of the current claims. Thus, Kuz'min not only fails to teach any species within the present claims, Kuz'min also fails to teach the genus encompassing the present compounds as alleged by the Office action. Accordingly, applicants respectfully submit that a *prima facie* case of obviousness has not been established and request that the rejection of claims 1–6, 11–13, 15, 17, 19–27, 31–33, 41–43 and 60 as allegedly being obvious in view of Kuz'min be withdrawn.

Claims 1–7, 11–17, 19–22, 24–27 31–37 and 41–47 are rejected under 35 U.S.C. § 103 as allegedly being obvious in view of Durmanov. Applicants traverse this rejection and request that it be withdrawn. Durmanov clearly teaches away from compounds described by the present claims, for example stating "[w]e think that growing quality $La(Lu-Sc)_3(BO_3)_4$ and $La(Y-Sc)_3(BO_3)_4$ crystals from melt by Czochralski technique are impossible." Thus Durmanov teaches that the only technique described in the reference is inoperative to produce examples of the presently claimed compounds.

Moreover, Kuz'min relies on the same Czochralski technique to produce crystals. As explained by Durmanov, this technique cannot be used to produce $La_{1-x}(M, M')_xSc_3(BO_3)_4$ materials as recited in claim 1. Thus, claim 1 and its dependent claims should be considered patentably novel in view of Kuz'min and Durmanov. Other claims include recite additional features and combinations of features that further distinguish the cited references. For example, claim 11 includes the feature of the compound being crystallized in the R32 space group. Neither Kuz'min nor Durmanov teach any compounds of the formula $La_{1-x}(M, M')_xSc_3(BO_3)_4$ in the R32 space group, and as explained by Durmanov, believe that it is impossible to prepare such materials. For this additional reason, claim 11 should be considered independently patentable.

V.   *Objected-to Claims*

Applicants appreciate Examiner Metzmaier's acknowledgement that claims 9, 10, 18, 29, 30, 39, 40 and 48 are directed to allowable subject matter. As suggested by the Examiner, these claims have been amended so that they no longer depend from rejected claims. Applicants therefore submit that claims 9, 10, 18, 29, 30, 39, 40 and 48 are in condition for allowance.

Conclusion

Applicants submit that in view of the foregoing amendments and remarks claims 1–3, 6–31, 33–48, 60 and 61–64 are in condition for allowance. Such action is respectfully requested.

Respectfully submitted,

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